Locations Based Promotions

Field of the Invention

The present invention relates to the field of providing information to a user from a computer system.

5   The invention has primarily been developed to provide users with promotional information, such as discount vouchers, based on their geographical location. However, the invention is not limited to this specific field.

Co-Pending Applications

10
Various methods, systems and apparatus relating to the present invention are disclosed in the following co-pending applications filed by the applicant or assignee of the present invention simultaneously with the present application:

HYC001US,	HYC002US,	HYC003US,	HYC004US,	HYC005US,
HYC006US,	HYC007US,	HYC008US,	HYC009US	HYC010US,
HYC011US,	HYT001US,	HYT002US,	HYT003US,	HYT004US
HYT005US,	HYT006US,	HYT007US,	HYT008US,	HYG001US,
HYG002US,	HYG003US,	HYG004US,	HYG005US,	HYG006US,
HYG007US,	HYG008US,	HYG009US,	HYG010US,	HYG011US,
HYG012US,	HYG013US,	HYG014US,	HYG015US,	HYG016US,
IRA001US,	IRA002US,	IRA003US,	HYJ001US,	HYJ002US,

The disclosures of these co-pending applications are incorporated herein by cross-reference. Each application is temporarily identified by its docket number. This will be

25   replaced by the corresponding USSN when available.

Cross References

Various methods, systems and apparatus relating to the present invention are disclosed in the following co-pending applications filed by the applicant or assignee of the

30   present invention. The disclosures of all of these co-pending applications and granted patents are incorporated herein by cross-reference.

10/409,876   10/409,848   10/409,845   09/575,197   09/575,195

09/575,159	09/575,132	09/575,123	09/575,148	09/575,130
09/575,165	09/575,153	09/693,415	09/575,118	09/609,139
09/608,970	09/575,116	09/575,144	09/575,139	09/575,186
09/575,185	09/609,039	09/663,579	09/663,599	09/607,852
09/575,191	09/693,219	09/575,145	09/607,656	09/693,280
09/609/132	09/693,515	09/663,701	09/575,192	09/663,640
09/609,303	09/610,095	09/609,596	09/693,705	09/693,647
09/721,895	09/721,894	09/607,843	09/693,690	09/607,605
09/608,178	09/609,553	09/609,233	09/609,149	09/608,022
09/575,181	09/722,174	09/721,896	10/291,522	10/291,517
10/291,523	10/291,471	10/291,470	10/291,819	10/291,481
10/291,509	10/291,825	10/291,519	10/291,575	10/291,557
10/291,661	10/291,558	10/291,587	10/291,818	10/291,576
10/291,589	10/291,526	6,644,545	6,609,653	6,651,879
10/291,555	10/291,510	19/291,592	10/291,542	10/291,820
10/291,516	10/291,363	10/291,487	10/291,520	10/291,521
10/291,556	10/291,821	10/291,525	10/291,586	10/291,822
10/291,524	10/291,553	10/291,511	10/291,585	10/291,374
10/685,523	10/685,583	10/685,455	10/685,584	NPA133US
09/575,193	09/575,156	09/609,232	09/607,844	09/607,657
09/693,593	NPB008US	09/928,055	09/927,684	09/928,108
09/927,685	09/927,809	09/575,183	09/575,160	09/575,150
09/575,169	6,644,642	6,502,614	6,622,999	09/575,149
10/322,450	6,549,935	NPN004US	09/575,187	09/575,155
6,591,884	6,439,706	09/575,196	09/575,198	09/722,148
09/722,146	09/721,861	6,290,349	6,428,155	09/575,146
09/608,920	09/721,892	09/722,171	09/721,858	09/722,142
10/171,987	10/202,021	10/291,724	10/291,512	10/291,554
10/659,027	10/659,026	09/693,301	09/575,174	09/575,163
09/693,216	09/693,341	09/693,473	09/722,087	09/722,141
09/722,175	09/722,147	09/575,168	09/722,172	09/693,514
09/721,893	09/722,088	10/291,578	10/291,823	10/291,560
10/291,366	10/291,503	10/291,469	10/274,817	09/575,154

09/575,129	09/575,124	09/575,188	09/721,862	10/120,441
10/291,577	10/291,718	10/291,719	10/291,543	10/291,494
10/292,608	10/291,715	10/291,559	10/291,660	10/409,864
10/309,358	10/410,484	10/683,151	10/683,040	09/575,189
09/575,162	09/575,172	09/575,170	09/575,171	09/575,161
10/291,716	10/291,547	10/291,538	10/291,717	10/291,827
10/291,548	10/291,714	10/291,544	10/291,541	10/291,584
10/291,579	10/291,824	10/291,713	10/291,545	10/291,546
09/693,388	09/693,704	09/693,510	09/693,336	09/693,335
10/181,496	10/274,119	10/309,185	10/309,066	NPW014US
NPS047US	NPS048US	NPS049US	NPS050US	NPS051US
NPS052US	NPS053US	NPS054US	NPS045US	NPS046US
NPT037US	NPA138US	NPA136US		

Some application has been listed by docket numbers, these will be replace when application number are known.

Background

As the amount of advertising and other information that reaches consumers has increased, it has become more difficult to ensure that such information is taken in by those consumers. One way of improving uptake of information is to target it at users that are likely, due to their demography or purchase history, to be interested in the particular product or service being advertised.

One way in which users can be targeted is by providing information at a location that users of the right demographic are likely to be. An example would be a computer conference, where advertising for computer software is more likely to be absorbed due to the large number of computer professionals that will tend to be in attendance. However, there is no way of ensuring that the users that see the advertising in a particular place will be interested in it.

Cross-promotion of products and services can also be desirable. However, it is difficult (if not impossible) to allow mass-produced goods to be interactively cross-

promotional. For example, if a soft-drink manufacturer wishes to run a cross-promotion with a film, the best that can be achieved is perhaps a voucher for a discount to see the film. However, to see more information about the film, and particularly to find out where and when the film can be seen, it is necessary for the user to ring a local cinema or look in a

5   newspaper or online for session times.

It would be desirable to provide a useful alternative to existing methods of providing users with information based at least partly on their real or inferred geographical location.

In various co-pending applications there is described a computer interface system

10   that has been designated "netpage". In brief summary, the preferred form of the netpage system employs a computer interface in the form of a mapped surface, that is, a physical surface which contains references to a map of the surface maintained in a computer system. The map references can be queried by an appropriate sensing device. Depending upon the specific implementation, the map references may be encoded visibly or invisibly, and

15   defined in such a way that a local query on the mapped surface yields an unambiguous map reference both within the map and among different maps. The computer system can contain information about features on the mapped surface, and such information can be retrieved based on map references supplied by a sensing device used with the mapped surface. The information thus retrieved can take the form of actions that are initiated by the computer

20   system on behalf of the operator in response to the operator's interaction with the surface features.

In its preferred form, the netpage system relies on the production of, and human interaction with, netpages. These are pages of text, graphics and images printed on ordinary paper, but which work like interactive web pages. Information is encoded on each page

25   using ink which is substantially invisible to the unaided human eye. The ink, however, and thereby the coded data, can be sensed by an optically imaging pen and transmitted to the netpage system.

Active buttons and hyperlinks on each page can be clicked with the pen to request information from the network or to signal preferences to a network server. In one

30   embodiment, text written by hand on a netpage is automatically recognized and converted to computer text in the netpage system.

Summary of the Invention

In a first aspect the present invention provides a method of providing a user with information about a product or service, via machine-readable coded data disposed on or in a surface of an article, the method comprising the steps, performed in a computer system, of:

receiving interaction data representing interaction of a sensing device with the coded data, the interaction data having been generated at least partially on the basis of at least some of the coded data being sensed by the sensing device as the interaction took place;

receiving location data indicative of a geographical location;

determining, from the location data and the interaction data, the information; and

providing the information to the user.

In a further aspect the present invention provides a computer system for providing a user with information about a product or service, via machine-readable coded data disposed on or in a surface of an article, the computer system being programmed and configured to:

receive interaction data representing interaction of a sensing device with the coded data, the interaction data having been generated at least partially on the basis of at least some of the coded data being sensed by the sensing device as the interaction took place;

receive location data indicative of a geographical location;

determine, from the location data and the interaction data, the information; and

provide the information to the user.

Brief Description of the Drawings

Figure 1 Location-Based Promotion interactions

Figure 2 Promotion interactions with Netpage Mobile Phone

HYD001US

Detailed Description of the Drawings

Overview

Hyperlabel is an optical tagging technology designed for uniquely identifying individual product items in the global supply chain. Hyperlabelling consists of covering a large portion of the surface of a product item with optically-readable invisible tags. A tag uniquely identifies the surface on which it appears, as well as its own position on the surface. The collection of tags on a surface thus defines a high-precision coordinate grid identifiably tied to the particular surface, to provide the downstream consumer benefits of Netpage interactivity.

Hyperlabel tags are applied during product manufacturer and/or packaging. This document provides an overview of the use of Hyperlabel as a facility for location-based services to consumers. A manufacturer may run a promotion by printing the promotion information on their product packaging. A user may click on a printed button on the promotion form to be sent details of the promotion. The response is location-specific in order to give the user promotion information that is relevant to the user's current location.

The remainder of this document illustrates the concepts of Hyperlabel location-based services in detail. To illustrate location-based services, the example of a movie promotion on a soft drink can is used. Note, however, that the same concepts apply to other location-based services. A user can click on a button on a movie promotion form to be sent
5   details of cinemas and session times located close to the user. The user may have the option of printing a promotion voucher for the movie.

Although specific reference is made to a Netpage pen, any Netpage sensing device can be used. Reference is also made to a Hyperlabel server. A Hyperlabel server is a specific instance of a Netpage page server. Reference is made to a Netpage registration
10   server. The registration server and the page/document server can be the same server.

Location-Based Services

Product Hyperlabel, with the Netpage system, provides a mechanism for providing
15   users with services based on the user's location. The user's location can be provided to the application by the user's sensing device, if it is GPS-equipped. Alternatively the user's location can be provided by the user's mobile phone network provider.

There are a number of location technologies available. One is Assisted Global Positioning System (A-GPS). This requires a GPS-equipped handset, which receives
20   positioning signals from GPS satellites. The phone network knows the approximate location of the handset from the nearest cell site. Based on this, the network can tell the handset which GPS satellites to use in its position calculations. This can speed up satellite acquisition by the handset, particularly in areas of poor reception such as indoors. Another technology, which does not require the device to be GPS-equipped, is Uplink Time
25   Difference of Arrival (U-TDOA). This determines the location of a wireless handset, using a form of triangulation, by comparing the time it takes a wireless handset's signal to reach several Location Measurement Units (LMUs) installed at the network's cell sites. The handset location is then calculated based on the differences in arrival times of the three (or more) signals.
30   An example of a location-based service that can be provided is a movie promotion on a soft drink can. The user may have a soft drink can (or other product packaging) on which is printed a promotion for a newly released movie. The user can click on the promotion and, based on the user's location, a list of nearby cinema locations and session times is sent to the user.

The user can get feedback in a variety of ways. The user's transaction may direct a Web page be displayed on the user's PC, PDA or other Web browsing device. The output device is the device via which the pen input comes, or alternatively it is an output device registered to the user or to the pen. An email, SMS, page message, voicemail message or phone call may be sent to the user from the promotion application via the Hyperlabel server (which can maintain the user's anonymity).

Location-Based Promotion

An interactive form can be printed on a Hyperlabel product label when the label is first created. The form can contain printed text, various types of input fields such as check boxes, text input fields, drawing input fields or signature fields, and control buttons. The form may contain printed control buttons to submit the user's request. The layout and interactivity of a product label is defined in the usual Netpage way.

Location-based services and promotions can be provided when the user's Netpage-enabled mobile phone or relay device sends the user's location information to the application. A promotion may be managed by the product manufacturer, by the product/service provider being promoted, or by a third-party promotion management service.

The location of the user is compared with the location of the service being promoted to determine the appropriate location-specific details to return to the user. Alternatively the user's location may be translated to a regular street/city address by the application. The street address can then be used to determine the most geographically-suitable service details to send to the user.

When the user clicks the promotion enquiry button, in this case <Where & When>, the promotion enquiry is sent to the Hyperlabel Server, and then on to the promotion application. The Netpage System allocates a random number, known as a promotion alias ID, in order to maintain the user's anonymity.

The promotion enquiry is sent to the promotion application. The user's identity is protected by the Netpage system. Whenever a user submits a promotion enquiry, a unique promotion alias ID is used by the Netpage system. The promotion alias ID may be allocated in a number of ways.

A user's promotion alias ID may be unique to a Netpage user and promotion ID combination. In other words a Netpage user would have a unique promotion alias ID for

each promotion they entered. If a manufacturer were running more than one promotion then the user would have more than one promotion alias ID. The manufacturer would not be aware of the connection between the promotion alias IDs.

An alternative is that the promotion alias ID may be unique to a Netpage user and manufacturer combination. If a manufacturer runs several promotions then a single promotion alias ID will be used for all the user's interactions with this manufacturer. The manufacturer can determine if a single Netpage user has accessed multiple promotions. The promotion alias ID may persist even after a promotion ends.

The object model in this document uses the promotion alias ID as unique to a Netpage user/promotion ID combination, but other methods for allocating a promotion alias ID are possible.

The Netpage system facilitates other functionality for promotions which may be implemented by the promotion application. For example, a movie voucher may have an age restriction associated with it, so that the voucher may only be printed by a user over eighteen years of age. The manufacturer or promoter may wish to request personal details from the user prior to printing the voucher. This type of functionality is similar to that described in Hyperlabel Competition Entry.

User Feedback

The user can get feedback in a variety of ways. The user's transaction may direct a Web page be displayed on the user's PC, PDA or other Web browsing device. The output device is the device via which the pen input comes, or alternatively it is an output device registered to the user or to the pen.

One location-based promotion enquiry scenario is illustrated in Figure 1. When a user invokes a function on a promotion form, the input is sent to the Netpage System, from the user's Netpage pen, in the usual way (A). The input is transmitted from the pen to the user's Netpage base station. The Netpage base station may be the user's mobile phone or PDA, or it may be some other Netpage device, such as a PC. If the user's base station is GPS equipped and knows its location, this is appended to the message relayed to the Hyperlabel server. If not, then the location may be requested from the mobile phone network (B,C). The input is relayed to the Hyperlabel server (D) and then on to the promotion application (E) in the usual way. The Hyperlabel server knows the promotion application to send the message to from the application ID associated with the form

button's hyperlink element. This is a standard Netpage mechanism. On receipt of the input, the application identifies the desired response and sends the appropriate response message to the Hyperlabel server (F). The Hyperlabel server, as part of the Netpage system, can know the identity and devices of the user. The Hyperlabel server will relay the promotion application's response to the user's phone (G) or Web browsing device (H) as appropriate.

Another location-based promotion enquiry scenario, where the Netpage sensing device is the user's mobile phone, is illustrated in Figure 2. When a user invokes a function on a promotion form, the phone will optionally request its location from the phone network (A,B). Alternatively the phone may be GPS-equipped and so will know its location. The promotion form data and location is sent to the Hyperlabel server (C) and then on to promotion application (D) in the usual way. On receipt of the input, the application identifies the desired response and sends the appropriate action/response message to the Hyperlabel server (E). The Hyperlabel server will relay the promotion application's response to the user's phone (F).

The interaction detail for a location-based promotion is shown in Figure 3. The Netpage user clicks a button on the promotion form to submit the enquiry. The Netpage pen sends the pen ID, the product's item ID, the user's location information, and the application ID to the Hyperlabel server. The Hyperlabel server sends the pen ID to the Netpage Registration server. The Netpage Registration server uses the pen ID to determine the Netpage user ID, and then allocates a promotion alias ID. The Hyperlabel server sends the promotion alias ID, application ID (i.e. the promotion ID) and the location information to the promotion application. The promotion application determines the appropriate enquiry response based on the user's location, and returns the promotion alias ID and the promotion enquiry response message to the Hyperlabel server. The Hyperlabel server sends the promotion alias ID to the Registration server which returns the default terminal ID for the user's default Web browsing device. The Hyperlabel server then sends the promotion enquiry response message to the terminal ID. Alternatively, the terminal is the device via which the input came.

The Netpage system allows for dynamic user registration. The scenarios mentioned above rely on the Netpage registration server identifying the user's Netpage user ID and the associated Web display terminal ID from the user's pen ID. If the user or pen is not already registered with the Netpage system then the user may be dynamically registered

with the Netpage system when they first use the promotion entry form. The temporary Netpage user ID may be maintained forever or only for the duration of the promotion.

Promotion Voucher Redemption

The user may have the option of printing a promotion voucher. The user clicks on the <Print Voucher> button and the voucher is sent to the user's default printer. This may be a Netpage printer or may be the phone's built-in printer (which may or may not be a Netpage printer). If the user prints a voucher for a promotion they can take this to the desired cinema to redeem it.

The promoter may apply various rules to vouchers. For example, a user may only be able to print one voucher per product (which can be verified by the product item ID), or a voucher may only be valid for a specific cinema or a specific session. The promotion application, in conjunction with the Netpage system, can facilitate this. A voucher may contain a digital signature, which enables the cinema to validate the voucher in an off-line environment, as long as the cinema has access to the corresponding public signature key.

If the voucher is printed on a non-Netpage printer the voucher can still be validated by the cinema by manually keying in the voucher serial number.

A promotion voucher redemption scenario is illustrated in Figure 4. The user presents the voucher to the cinema box office. The operator scans the voucher, and the voucher data is sent to the box office terminal (A). The terminal ID and voucher data is sent to the cinema server (B) and then on to the Hyperlabel server (C). The Hyperlabel server sends the cinema ID, terminal ID, and voucher data to the promotion application for validation (D). The promotion application validates the voucher and sends the response back to the Hyperlabel server (E) which sends it on to the cinema server (F). The cinema server then sends the response to the box office terminal (G). The Promotion Voucher Redemption interaction detail is shown in Figure 5.

Location-Based Promotion Object Model

The location-based promotion object model revolves around promotions, promotion users and locations.

A manufacturer may have many promotions. Each promotion may be associated with a product class. Alternatively, a promotion may be associated with a product item. A

promotion has a unique promotion ID, a name, description, a start date and end date. The Promotion class diagram is shown in Figure 6.

In the case of the example being used throughout this document, a promotion has an associated movie. A movie comprises the movie ID, movie name, rating, a brief description and details. A movie may be showing at a number of cinemas, and a cinema may be showing a number of movies. Associated with a movie and cinema combination are a number sessions. A cinema has a cinema ID, cinema name, and address, and associated with a cinema is a location. A session has a start time and details. The Movie class diagram is shown in Figure 7.

A Netpage user can interact with many promotions. A Netpage user is allocated a promotion alias ID. The Netpage user may be allocated a unique promotion alias ID for each promotion. Another alternative is that the Netpage user may be allocated a unique promotion alias ID for each manufacturer, and this alias ID will be used for all promotions associated with this manufacturer. Regardless of how the promotion alias ID is allocated, the promotion user object comprises the promotion alias ID. The Promotion User class diagram is shown in Figure 8. The Netpage user ID may be a temporary Netpage user ID, allocated by the Registration server. A temporary Netpage user ID has an associated return messaging channel, which may be a phone number, pager number, PDA network address, email address, or subscriber identifier

Associated with a promotion user is a location. A location comprises latitude, longitude, and the time the location reading was taken. The User Location class diagram is shown in Figure 9.

A Netpage user has a default Web terminal, with an associated terminal ID. This is the default Web display device for the user. The Default Web Terminal class diagram is shown in Figure 10.

A promotion user may have promotion vouchers, and each voucher is associated with a particular promotion. A promotion voucher has a voucher ID, a valid start and valid end date, a status (e.g. valid, used) and optionally a digital signature. The Promotion Voucher class diagram is shown in Figure 11.

A promotion form is a special type of Netpage form. The form identifies the promotion ID that the form relates to, as shown in Figure 12.

Location-Based Promotion User Interface

The user typically obtains the Hyperlabel Promotion Form from product packaging, or perhaps a form available at the place of purchase.

5   The Promotion Request user interface flow is shown in Figure 13.

A Promotion Form is shown in Figure 14. The promotion form shows details of the promotion. In the example illustrated, the promotion form shows the movie name, rating and a brief description.

The user presses the <Movie Details> button to query more detailed information

10   about the movie. The Movie Information, shown in Figure 15, is displayed on the user's default Web display terminal. The movie details include the movie name, rating and movie information.

The user presses the <Where & When> button to query location-based information about the movie locations and session times. The Promotion Details, shown in Figure 16,

15   are displayed on the user's default Web display terminal. The promotion details include the movie name, and the cinema name, cinema address, and session times for each cinema close to the user's current location.

The user presses the <Print Voucher> button to print a promotion voucher on their Netpage printer. The promotion voucher shows the movie name, the voucher start and end

20   dates, and, optionally, a digital signature. The digital signature allows the receiving supplier (in this case the cinema) to validate the authenticity of the voucher even if the cinema operator is off-line. The Promotion Voucher is shown in Figure 17.

Alternatively, the promotion form on the product packaging may serve as the voucher, as shown in Figure 18.

25   **Point of Sale Location**

In yet other embodiments, the user's location can be inferred by determining the location of the product, or the location that the product is last known to have been. For example, as it arrives at a shop, or as it is put onto a shelf, the label of a Hyperlabel-enabled product is scanned, and an association between the shop and that particular product is

30   stored in a database. Once the user purchases the product and interacts with it using a Hyperlabel-enabled device, the location of the user can be inferred by looking up the association.

Of course, if the user has traveled a significant distance before scanning the Hyperlabel-enabled product, it is possible that the inferred location will be a significant distance from the actual location of the user. However, in some cases this disparity may be acceptable given that the only alternative is no location information at all.

5   This option may also be advantageous for tourist destinations, specialist shops, and other locations that people might be encouraged to travel some distance to, since any location-based information (or special offers) returned to the user as a result of interaction with the Hyperlabel-enabled product will remind the user of the location from which the product was purchased and encourage them to visit again.

10 **Location-related Offers**

As well as sending information indicative of a specific location, it is also possible to send information that is based on the *type* of location the user is in.

For example, if the user is determined to be at a beach, the system can be designed to send a voucher for a discount ice-cream. In this case, the brand of ice-cream can be

15   identified without identifiying any specific commercial entity that will supply it. Other factors can also be used, such as the time of year or the actual weather. If it is the middle of winter, for example, the system can be configured to send a voucher or promotional information for a coffee of a particular brand, whereas in the middle of summer, an ice-cream voucher or information may be used.

20   Similarly, if the user is determined to have been in the vicinity of an area with many car sales yards, it is possible to infer that the user is looking for a car and to send promotional information or a voucher to the user.

Even more specifically, if the location of the user can be determined with sufficient accuracy, then the information can be sent in such a way that it does not need to

25   explicitly identify a location. For example, if the user is inside a particular store, the system can be configured to determine this and send a voucher useable in that store, but without identifying a specific location.

Conclusion

It will be appreciated by those skilled in the relevant fields that a number of other embodiments, differing from those specifically described, will fall within the scope of the present invention. Accordingly, the invention is not intended to be limited to the specific embodiments described in the specification, including documents incorporated by cross-reference as appropriate.